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Healing Herbs for Kidney Stones

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ABSTRACT

Kidney stones are small, solid pieces of material that form in the kidneys. Kidney stones make up about 9% of all kidney-related diseases. The most common symptom of kidney stones is pain, which can be severe and last for hours or days after the stone has passed. Other symptoms include blood in urine, fever, nausea or vomiting, and pain when urinating or passing stool. The diagnosis of kidney stones is usually done through imaging like an ultrasound exam or computerized tomography (CT) scan. This allows for the detection of the location and size of the stone inside the body. Kidney stones are the result of a build-up of minerals and salts in the urine. They usually form when there is not enough fluid to dilute or break down these substances. Once they form, they can cause severe pain and other health problems. In developing countries like Asian countries, kidney stones have become a major drawback, it has typically affected 10-12% of the industrialized population. Some treatments for kidney stones include medications, diet changes, and so on. Herbs and herbal drugs have created interest among the people by their clinically proven effects like immunomodulation, antimutagenic, they provide to be a reliable and effective source of kidney stone remedies. Various herbal treatments for kidney stones are available. There are 70 herbal drugs used in the treatment of kidney stones which include Gokhru, Bearberry, Black cumin seed, Ammi visagna, fenugreek, etc.

INTRODUCTION:

Renal calculus (also known as kidney stones, nephrolithiasis, or urolithiasis) are hard deposits made from minerals and salts that form within your kidneys. They are little, hard deposits of mineral and acid salts that form on the inner surface of the kidneys, shaped because of the crystallization of minerals and waste materials found in excretion. They may be little and pass neglected out of the tract. If they are giant in size of grapes, they'll block the urinary pathway that results in severe pain (Kidney stones pain) and hemorrhage whenever they travel through the ureter.

Causes Of renal calculus

- 1) Possible causes comprise drinking insufficient water, exercise (too much or too little), obesity, weight loss surgery, or consuming food with an excessive amount of salt or sugar.
- 2) Kidney stones happen once your urine incorporates a high concentration of minerals and alternative substances – like calcium(hypercalcemia), oxalate(hyperoxaluria), uric acid(hyperuricemia), and low levels of citrate(hypocitraturia) – that combine to form to create crystals. These stones or crystals stick with creating one or a lot of stones.
- 3) A kidney stone forms once an excessive amount of certain minerals in your body accumulate in your urine. once the body is hydrous, urine becomes more concentrated with high levels of minerals. once levels of minerals are higher, there are probabilities kidney stones can form.
- 4) Having an excessive amount of calcium within the urine.

Types Of Kidney Stone

- Calcium Stones (75-80%)
- Uric Acid Stones (6-10%)
- Struvite Stones (2-15%)
- Cystine Stones (1-2%)

Calcium stones:

The stones of Calcium oxalate, Ca urate, and Ca phosphate are related to hypercalciuria caused by hyperparathyroidism. people related to disease, increase absorption of calcium from the gut leading to renal calcium or phosphate leak, hyperuricosuria, hyperoxaluria. hypocitraturia and hypomagnesuria developed.

Struvite stones

Struvite is composed of magnesium ammonium phosphate stones which grow to fill the collecting system (partial or complete staghorn calculi). This stage is developed due to chronic urinary tract infections caused by Gram-negative urea-splitting rods including Proteus, Pseudomonas, and Klebsiella species.

Uric acid stones

The formation of uric acid stones depends upon high purine intake medicines or high cell development (e.g. malignancy) which substantially start in cases with gout. Uric acid stones mainly form in slightly acidic urine (pH5.5). They're visible in nature and generally radiolucent on X-ray film.

Cystine stones

Cystine stones become because of having hereditary intrinsic metabolic disorder known as cystinuria within which the re-absorption of cystine within the renal tube is impaired. These stones may be tough to seek out on X-rays as a result of high sulfur content. In drug-induced stones, many medications will participate in the formation of renal stones.

Drug-induced stones

Few drugs also participate in the formation of renal stones which can be useful for other diseases, eg. indinavir, atazanavir, triamterene, silicate (antacids), and sulfa drugs. These stones are radiolucent(seen on X-rays)and are rare.

To date, the majority of the world population is unable to get the benefits of modern health care services for the treatment of urolithiasis due to socio-economic factors. Consequently, they are still relying on herbal medicines to cure urolithiasis. So today, 80% of the world's population depends on herbal medicines to treat their diseases. A wide variety of herbal plants are used to treat kidney stones. The use of herbal medicines is safer than synthetic

medicines and they are cheaper as compared to synthetic. They are regarded as an acceptable, easily available, safe source of active compounds for pharmaceuticals. The therapeutic effects of herbal plants on the kidney and urinary tract where the calculi's may be located have been studied and their efficacy has been demonstrated.^{[1][2]}

OBJECTIVES

This study aimed to determine the herbal plants having antiurothialitiac activity which are safer to use, cheap, easily available, and acceptable.

HERBAL PLANTS FOR TREATMENT OF KIDNEY STONES.

BEARBERRY UVA-URSI (ARCTOSTAPHYLOS PUNGENS)

Synonyms

Uva ursi, Bearberry leaves, Busserole.

Biological Source

Dried leaves of Arctostaphylous uva-ursi (Linne) Sprengel.

family Ericaceae.

Geographical Source

It is found in regions of Central and North Europe, North America, Canada, and Scotland.

Chemical Constituents

The leaves contain a glycoside ie arbutin which contains phenolic aglycone. The leaves also contain methyl arbutin, quercetin, ursone, iridoids, quinones, tannins (6–10%), gallic acid ursolic acid, α -amyrin, β -amyrin, and terpenoids.[kokate] Scientists have identified phenol glycosides and flavonoids like antocyanes, hydroxycinnamic acids, saponins, lignans, iridoides, polysaccharides, and essential oils in the stems and leaves of the bearberry.^[3]

MOA & USES-

It is the official recommendation for the treatment of urinary tract infections. Uva-ursi acts as a urinary antiseptic through its active ingredient arbutoside, the glycoside arbutin, which is chemically transformed in the gastrointestinal, hepatic, and urinary tracts to the antimicrobial

hydroquinone. Bearberry has its effects on the genitourinary system, usually as a diuretic, nephrotic and antibacterial effects. Uva-ursi prevented the development of possible risk factors of nephrolithiasis such as acidic urine pH, increased urinary excretion of calcium ions, phosphate ion, and citrate ion.^{[4][5]}

GOKHRU (TRIBULUS TERRESTRIS)

Synonyms- Puncture vine, Tribulus

Biological source- Dried ripen seeds of Plant Tribulus terrestris linn.

Family- Zygophyllaceae

Geographical source- Generally found in the warmer region like India, Sri Lanka, West Tibet.

Chemical constituents-

i) alkaloids like harmine & Harman

ii) Steroidal sapogenins like diosgenin, gitogenin.^[6]

MOA & USES-

Gokhru is one of the most commonly utilized herbs for renal dysfunction or in the treatment of kidney stones. It is effective because of its diuretic, analgesic, and lithophytic properties. Traditionally used in treatment for cystitis and renal calculi and as a diuretic. The mechanism of preventing nephrolithiasis is thought to occur by decreasing urinary oxalate excretion through alteration in hepatic oxalate synthesizing enzymes, glycolate oxidase (GAO), and glycolate dehydrogenase (GAD).^{[7][8]}

BLACK CUMIN SEED (NIGELLA SATIVA):

Synonyms: Also known as the common bean, French bean, Rajma, Barbat Beej & Haricot common.

Biological name: Phaseolus vulgaris, family Fabaceae

Geographical Source: Brazil is a top producer in the world. Red kidney beans are known as “Rajma” in northern India. Maharashtra, Jammu, Kashmir, Himachal Pradesh, Uttarakhand, West Bengal, Tamil Nadu, Kerala, and Karnataka are major kidney beans found in states of

India. Is an annual flowering plant found in Southern Europe, North Africa, and Southwest Asia?^[9]

Chemical Constituents

Beans have protein iron complex carbohydrates, folate, Beans also have fiber and soluble fiber, one cup of cooked beans provides 9 to 13 grams of fiber. Soluble fiber help for lowering blood cholesterol.

MOA & USES

Black seeds prevented the formation of calcium oxalate (CaOx) deposits in prevention groups but also reduced CaOx depositions, thus the urine oxalate level also significantly decreased.^[10]

Caraway always prevents the formation of calcium oxalate stones and causes the breakdown of the stones. Apart from antiurothialiatric activity is also used as a Diuretic, antihypertensive, antidiabetic, anticancer, immune-modulatory, antimicrobial, anthelmintic, analgesic and anti-inflammatory, etc.

AMMI VISNAGA

Synonyms: Bishop's flower, Khaizaran, Khellakraut, Khillah, Pick Tooth, Toothpick weed, Viznaga.

Biological Source: These are the fruits of Ammi visnaga Linn.,

family: Umbelliferae.

Geographical Source: It is more found in Europe, West Asia, Egypt, West Africa.

Chemical Constituents

The drug contains furanocoumarin compounds. The major constituents are khellin and visnagin. Khellol and khellol glucoside are also present. It also contains visnadin, samidin, dihydrosamidin, fixed oil, and proteins.

MOA & USES

For the treatment and/or prevention of calcium oxalate kidney stones, different approaches have been tested. Different compounds were used to control oxalate urolithiasis and increase

the solubility of oxalate while calcium carbimide as an enzymic inhibitor in the treatment of primary hyperoxaluria. Safer, in folk medicine, several herbal drugs were used against kidney stones. Oxalate metabolism is considered to be almost identical between rats and humans, a rat model of calcium oxalate nephrolithiasis can be used. We studied the effects of water extract of seeds of Ammi visnaga (called Al-Khillah in Saudi folk medicine) on the inhibition of oxalate nephrolithiasis.^[11]

A variety of tea prepared from the fruits of Ammi visnaga has been traditionally used by patients with renal stones in Egypt as well as in the rest of the world. The aqueous extract of this fruit increases the dissolution of cystine stones in the kidneys. The fruit and its two major constituents, khellin and visnagin show greater effects in the management of renal calculus caused by hyperoxaluria. Visanga being an effective muscle relaxant has been used for centuries to relieve the pain of kidney stones.^[12]

Fenugreek seed (*Trigonella foenum-graecum*):

Biological Source:- Fenugreek (*Trigonella foenum graecum*) is an annual plant that belongs to the

Family Leguminosae.

Geographical Source:- South Asia, North Africa, Middle East, Mediterranean Europe, China, South East (SE) Asia, Australia, the USA, Argentina, and Canada.

Chemical Constituents:- Fenugreek seed and leaves are a rich source of a wide diversity of medicinally rich phytochemicals like steroidal saponins (diosgenin), fenugreekine (alkaloid), galactomannan (carbohydrate), 4-hydroxy isoleucine (amino acid).

Tryptophan and lysine, lipids (5–10%) or fixed oil, alkaloids of pyridine type (0.2–0.38%) as in trigonelline; choline (0.5%), etc.^[13]


MOA & USES-

To prevent and treat kidney stones. In an animal study, it was found that Fenugreek seed significantly reduced calcification in the kidney and helped prevent kidney stones. The plant has been used traditionally in Indian Ayurvedic medicines as well as in traditional Tibetan and reduces blood sugar and blood cholesterol to have a diuretic effect on cirrhotic ascitic patients.^[14]

Some other herbal drugs used are as follows^[15]

No	Scientific name	Common name	Medical uses
1	<i>Adiantum capillus-verneris</i>	Maidenhair	Plant – diuretic, clear stones in the kidney, bladder, and urinary tract
2	<i>Agrimonia eupatoria</i>	Common agrimony	Plant – treat kidney disease, clear urinary obstructions, and stones
3	<i>Allium cepa</i>	Onion	Bulb skin – diuretic, clear obstructions of urinary tract
4	<i>Aloe vera</i>	Aloe	Plant juice – clear urinary obstructions
5	<i>Amomum</i> sp.	Amomum	Plant – clear stones and obstructions of kidney and urinary tract
6	<i>Anthemis</i> sp.	Chamomile	Plant – diuretic, clear stones and obstructions and cure diseases and inflammation of the kidney
7	<i>Apium graveolens</i>	Celery	Plant – diuretic, clear stones and obstructions of the urinary tract, cure kidney diseases
8	<i>Aristolachia</i> sp.	Birthwort	Plant – diuretic, cure kidney diseases, clear kidney stones
9	<i>Artemisia deacunulus</i>	Tarragon	Plant – clear obstructions and stones of kidney and urinary tract

10	Artemisia judaica	Judean wormwood	Herb – clear obstructions and stones of kidney and urinary tract
11	Asparagus officinalis	Asparagus	Plant – cure kidney and urinary disorders Seed – strengthen the kidney Root – diuretic, clear stones in the bladder and urinary tract
12	Astragalus gummifer	Tragacanth gum	Resin – diuretic, clear kidney stones, treat kidney pain
13	Atriplex halimus	Saltbush shrub	Plant – clear stones and obstructions of urinary tract
14	Tribulus terrestris	Gokhru	Plant – diuretic, used to clear stones and obstructions of urinary tract
15	Trigonella foenumgraceum	Fenugreek	Plant – diuretic, used to clear stones and obstructions of urinary tract
16	Ammi visnaga	Visnaga	Fruit- diuretic, clear stones, and obstructions of urinary tract
17	Atropa Belladonna	belladonna	Plant- diuretic, clear the urinary stones
18	Arctostaphylos uva ursi	Bearberry	Leaves – diuretic, clear stones, and obstructions of the urinary tract and kidney
19	Dryopteris pallida	Shield wood fern	Plant – clear obstruction

20	Ecballium elaterium	Squirting cucumber	Plant – clear stones and obstructions of urinary tract
21	Eruca sativa	Garden rocket	Plant – diuretic, clear obstructions of urinary tract
22	Gossypium herbaceum	Cotton	Seed – clear stones and obstructions of urinary tract
23	Jasminum sp.	Jasmines	Plant and oil – diuretic, clear obstructions
24	Juglans regia	Walnut	Oil – treat kidney disease Seed – clear urinary obstructions and stones Unripe fruit – diuretic
25	Laurus nobilis	True laural 	Leaves – diuretic, clear stones, and obstructions of the urinary tract and kidney Oil – warm the kidney
26	Lithospermum officinale	Common gromwell	Plant – diuretic, clear stones, and obstructions of urinary tract
27	Majorana hortensis	Majoram	Herb – diuretic, clear kidney and urinary obstructions and stones

CONCLUSION:

In ancient medicinal texts, herbal drugs and their formulations are claimed to have anti-urolithiatic potential, most of the herbal plants were found to either dissolve the stones or inhibit the method of urinary stone formation. The overuse of synthetic drugs, which ends in a higher incidence of adverse drug reactions, has intended humans to come back to nature for

safe remedies. Herbal medicines are more efficacious with a higher margin of result which is in a slow peak, but without harming anything in the body. While there are a number of effective modern treatments for renal and urinary conditions, herbal drugs are proven to bring relief without detrimental side effects and these drugs can be used for further research studies.

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